**Evidence of health benefits of physical activity**

**All cause mortality**

The effects of physical activity on overall mortality are reasonably consistent and strong. The inverse relationship between physical activity and all-cause mortality holds for all age groups and for diverse populations in different countries. There is strong evidence for women, at most stages of life, that even moderate levels of activity, such as regular walking, are protective. There is a lower risk of all-cause mortality amongst adults who adopt physical activity even if adopted later in life.

An increase in physical activity for middle-aged men and women appears to confer a health benefit in terms of subsequent risk of death. Even moderate and incidental forms of activity, such as using the stairs and active cycling to and from work are associated with reduced risk of mortality.

**Cardiovascular disease prevention**

Numerous population studies since the 1950s have shown that people who are sedentary have between a 1.5-fold and a twofold higher risk of incident or fatal cardiovascular events, compared with those who are at least moderately physically active. The maximum cardiovascular benefit occurred when people moved from sedentary or low fitness groups in the population to moderate activity or moderate fitness levels. There is some evidence that physical activity amongst young people and adolescents can favourably impact upon other cardiovascular risk factors that also contribute to the later risk of coronary artery disease.

***Cholesterol and blood pressure:***  Physical activity improves lipid profiles and blood pressure among adults, and more sustained activity has a role in obesity prevention.

***Stroke:***  For older adults, physical activity reduces the risks of cerebrovascular disease, especially ischaemic stroke.

**Cancers**

The best evidence for a cancer prevention role for physical activity relates to colon cancer. There is a clear and consistent dose–response relationship between different forms of physical activity and colon cancer. It is thought that physical inactivity causes around one-fifth of all colon cancers in the population, indicating a strong role for primary prevention.

The next best evidence relates to breast cancer, but the quantum of physical activity required, and the groups where activity is most effective, are still not determined. Clear preventive recommendations are not yet possible, because the effects of physical activity on breast cancer risk seem to be confounded by other factors such as obesity and possibly by menopausal status. However, the evidence is consistent enough, with three-quarters of studies finding a positive relationship, although the biological mechanisms have not been elucidated.

**Diabetes**

There is excellent evidence that physical activity has a role in the primary prevention and also in the treatment of non-insulin dependant diabetes mellitus. Longitudinal studies show that the risks of developing diabetes in populations are lower in people who are physically active than those who are sedentary, even after adjustment for body mass index. This is true even for moderate levels of activity, such as regular, brisk walking. Physical activity is an important in the management of diabetes because it may improve glucose metabolism, increase insulin sensitivity, and prevent the increase in heart disease among people with diabetes.

**Injury prevention (falls)**

Physical activity is a beneficial component of the prevention of injurious falls, partly through effects on muscle strengthening and balance, and possibly through maintaining bone density. Reviews have shown that physical activity reduced the risk of falling, although some of the programs were supplemented by education and other interventions. Physical activity is seen commonly as a means of maintaining strength and vigour, and preventing the functional declines of ageing. Both regular movement and strength training may assist in maintaining balance and flexibility, and, thereby, reduce the risk of falls in the elderly.

Although physical activity among adults may maintain bone mineral density (prevent osteoporosis), the greatest primary prevention role for physical activity may be in childhood and adolescence, during which period lifelong bone deposition occurs. Thus, being active in adolescence is important for the prevention of osteoporosis and the risk of hip fractures decades later.

**Mental health**

The mental health benefits of physical activity have been recognised for many decades. Recent reviews have shown that aerobic exercise or strength training programs can reduce the symptoms of depression. Physical activity is as effective as meditation or relaxation in the treatment of anxiety. A recent controlled trial found that exercise training among older adults was as effective as antidepressant medication, although the onset of benefit was slower.

In cross-sectional surveys, associations are often seen between physical activity and feelings of wellness, lowered levels of stress and anxiety and positive mental health in populations.

**Risks of physical activity**

There is a small risk of injury during physical activity. The most frequent settings for musculoskeletal injuries are in competitive sports (overuse injuries) or in untrained sedentary individuals who embark upon sudden vigorous activity. Injury rates are very low for moderate intensity activities such as walking, gardening or recreational swimming and cycling.

Another area of risk is that of an acute cardiovascular event during participation in physical activity. Although the risk of cardiac events is higher among people who are vigorously active, this increase in risk is outweighed by the net benefit of being active for that individual. There are also recent data that acute cardiac arrests are less likely for those who are active regularly.

**Other health benefits**

Benefits of activity beyond the priority health areas already mentioned include:

* Osteo-arthritis/rheumatoid arthritis:  For people with osteo-arthritis or rheumatoid arthritis, there is some evidence that moderate physical activity relieves symptoms, possibly reduces joint swelling, and is associated with improved psychosocial and functional status;
* Immunity:  Physical activity may positively influence the immune system, and may be of assistance in a range of other chronic disease states;
* Ageing:  Through the ageing process, physically active individuals may experience fewer years of disability; people who are active may have up to five years more of disability-free life and, hence, improvements in quality of life; and
* Obesity Prevention:  One important health benefit of physical activity is to contribute to obesity prevention. Approaches to addressing the role of physical activity in obesity prevention is a complex issue, partly because the amount of activity required for weight loss may be greater than for other health benefits. It may be necessary to accumulate 60–100 minutes of daily, moderate activity for weight loss (WHO 1997), which is more than twice the duration recommended for general health benefits. This requires new ways of developing and implementing programs that decrease sedentary time and increase incidental daily physical activity.